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west may watch the conjunction of the star with Sat. II., which occurs, geocentrically, at $16^h\ 52^m$ Gr., the satellite passing $7''\cdot0$ south of the star. The conjunction of the star with Sat. I. occurs earlier in the night, at $11^h\ 40^m$ Gr., the satellite passing $11''\cdot0$ south, too late for European, too early for American, observers.

The measurements of the *fifth* satellite, which Prof. Barnard has secured during its third apparition on eight nights (October 8, 29, November 4, 11, 12, 18, 19, December 3, 1894) and which he has kindly communicated before publication, leave the correction required by the ephemeris in No. 3,253 of the *Astron. Nachrichten* rather undecided, so that for the present ephemeris I have made no change in the adopted daily rate of motion $722^\circ\cdot633$, which corresponds to a period of $11^h\ 57^m\ 22^s\cdot60$. No other measurements made during last season have come to my knowledge.

Ephemeris of the Fifth Satellite of Jupiter, 1895–96.

Greenwich Noon.		P + 90°.	a_5	b_5	l_5-L.	Greenwich Times of greatest Elongations.					
1895.		°	″	″	°	h	m		h	m	
Oct.	21	106·61	47·00	+0·55	185·85	14	45	W.	20	44	E.
	23	106·68	47·27	·54	191·04	14	35		20	33	
	25	106·75	47·55	·53	196·24	14	24		20	23	
	27	106·81	47·83	·53	201·45	14	14		20	13	
	29	106·87	48·12	·52	206·67	14	4		20	2	
	31	106·93	48·41	·51	211·91	13	53	W.	19	52	E.
Nov.	2	106·98	48·70	+0·51	217·15	13	43		19	41	
	4	107·03	49·00	·50	222·41	13	32		19	31	
	6	107·07	49·30	·49	227·67	13	22		19	20	
	8	107·11	49·60	·49	232·95	13	11		19	10	
	10	107·15	49·90	·48	238·24	13	1	W.	18	59	E.
	12	107·18	50·21	+0·48	243·55	18	49	E.	24	47	W.
	14	107·20	50·52	·47	248·86	18	38		24	37	
	16	107·22	50·83	·47	254·19	18	28		24	26	
	18	107·24	51·14	·46	259·52	18	17		24	16	
	20	107·26	51·46	·46	264·87	18	6		24	5	
	22	107·27	51·77	+0·45	270·23	17	56	E.	23	54	W.
	24	107·27	52·08	·45	275·61	17	45		23	43	
	26	107·27	52·39	·45	280·99	17	34		23	33	
	28	107·27	52·70	·44	286·38	17	23		23	22	
	30	107·26	53·01	·44	291·79	17	13		23	11	
Dec.	2	107·25	53·31	+0·44	297·21	17	2	E.	23	0	W.
	4	107·23	53·61	·44	302·63	16	51		22	50	
	6	107·21	53·91	·43	308·07	16	40		22	39	
	8	107·19	54·20	·43	313·52	16	29		22	28	
	10	107·16	54·49	·43	318·98	16	18		22	17	

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Greenwich Noon.		P+90°.	a_5	b_5	l_5-L.	Greenwich Times of greatest Elongations.	
1895.		°	″	″	°	h m	h m
Dec.	12	107·13	54·77	+0·43	324·44	16 7 E.	22 6 W.
	14	107·09	55·05	·43	329·92	15 56	21 55
	16	107·05	55·32	·43	335·41	15 46	21 44
	18	107·00	55·58	·43	340·90	15 35	21 33
	20	106·95	55·83	·43	346·40	15 24	21 22
	22	106·90	56·07	+0·43	351·91	15 13 E.	21 11 W.
	24	106·84	56·30	·43	357·43	15 2	21 0
	26	106·78	56·52	·43	2·95	14 51	20 49
	28	106·71	56·73	·43	8·48	14 40	20 38
	30	106·64	56·93	·43	14·01	14 29	20 27
1896.							
Jan.	1	106·57	57·11	+0·44	19·55	14 18 E.	20 16 W.
	3	106·49	57·28	·44	25·09	14 7	20 5
	5	106·42	57·44	·44	30·64	13 55	19 54
	7	106·34	57·58	·45	36·18	13 44	19 43
	9	106·25	57·71	·45	41·73	13 33	19 32
	11	106·16	57·82	+0·45	47·28	13 22 E.	19 21 W.
	13	106·08	57·92	·46	52·83	13 11	19 10
	15	105·99	58·00	·46	58·38	13 0	18 59
	17	105·89	58·06	·46	63·93	12 49	18 48
	19	105·80	58·11	·47	69·47	12 38	18 37
	21	105·71	58·13	+0·47	75·01	12 27 E.	18 26 W.
	23	105·61	58·15	·48	80·55	12 16	18 15
	25	105·51	58·14	·48	86·08	12 5	18 4
	27	105·42	58·12	·49	91·61	11 54	17 53
	29	105·32	58·08	·49	97·13	11 43	17 42
	31	105·23	58·02	+0·49	102·64	11 32 E.	17 31 W.
Feb.	2	105·13	57·95	·50	108·15	11 21	17 20
	4	105·04	57·86	·50	113·64	11 10	17 9
	6	104·94	57·75	·51	119·13	10 59	16 58
	8	104·85	57·63	·51	124·60	10 48	16 47
	10	104·76	57·49	+0·51	130·07	10 37 E.	16 36 W.
	12	104·67	57·34	·52	135·52	10 27	16 25
	14	104·59	57·17	·52	140·97	10 16	16 14
	16	104·51	56·99	·53	146·40	10 5	16 4
	18	104·43	56·80	·53	151·81	9 54	15 53
	20	104·35	56·59	+0·53	157·21	9 43 E.	15 42 W.
	22	104·28	56·37	·53	162·60	9 33	15 31
	24	104·21	56·14	·54	167·98	9 22	15 21
	26	104·14	55·90	·54	173·34	9 11	15 10

Greenwich Noon.	P + 90°.	a_5	b_5	$l_5 - $ L.	Greenwich Times of greatest Elongations.	
1896.	°	"	"	°	h m	h m
Feb. 28	104·08	55·65	·54	178·69	9 1	14 59
Mar. 1	104·02	55·40	+0·54	184·02	8 50 E.	14 49 W.
3	103·97	55·13	·54	189·33	8 39	14 38
5	103·92	54·85	·54	194·63	8 29	14 28
7	103·87	54·57	·54	199·92	8 18	14 17
9	103·83	54·28	·54	205·19	8 8	14 7
11	103·79	53·99	+0·54	210·44	7 57 E.	13 56 W.
13	103·76	53·69	·54	215·68	7 47	13 46
15	103·74	53·39	·54	220·90	7 37	13 35
17	103·72	53·08	·54	226·11	7 26	13 25
19	103·70	52·77	·54	231·30	7 16	13 15
21	103·69	52·46	+0·54	236·48	7 6 E.	13 4 W.
23	103·68	52·14	·54	241·64	6 55	12 54
25	103·68	51·83	·53	246·79	6 45	12 44
27	103·68	51·51	·53	251·92	6 35	12 33
29	103·69	51·20	·53	257·04	6 25	12 23
31	103·71	50·88	+0·52	262·15	6 14 E.	12 13 W.
Apr. 2	103·73	50·56	·52	267·24	12 3 W.	18 2 E.
4	103·75	50·25	·52	272·31	11 53	17 52
6	103·78	49·93	·51	277·38	11 43	17 42
8	103·81	49·62	·51	282·43	11 33	17 31
10	103·85	49·31	+0·50	287·47	11 23 W.	17 21 E.
12	103·89	49·01	·50	292·49	11 13	17 11
14	103·93	48·70	·49	297·50	11 3	17 1
16	103·98	48·40	·49	302·50	10 53	16 51
18	104·04	48·10	·48	307·50	10 43	16 42
20	104·10	47·80	+0·48	312·49	10 33 W.	16 32 E.
22	104·16	47·51	·47	317·44	10 23	16 22
24	104·22	47·23	·46	322·40	10 13	16 12
26	104·29	46·95	·46	327·35	10 3	16 2
28	104·37	46·67	·45	332·29	9 53	15 52
30	104·44	46·39	+0·44	337·22	9 44 W.	15 42 E.

The differences between successive values of $l_5 - $L for the interval of two days vary between 1444°·93 and 1445°·55. The values are to be interpolated for the times at which the rectangular co-ordinates are measured, when the corresponding computed co-ordinates will be

$$x_5 = a_5 \sin (l_5 - \text{L}) \text{ in pos. angle P} + 90^\circ$$
$$y_5 = b_5 \cos (l_5 - \text{L}) \quad \text{,,} \quad \text{,,} \quad \text{P.}$$

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Data for computing the Positions of the Satellites of Jupiter, 1895–96. By A. Marth.

The following data for computing the places of the satellites for the present apparition of *Jupiter* are a continuation of those for the four preceding apparitions published in the *Monthly Notices.* They furnish, at intervals of ten days, the mean longitudes l of the satellites and the arguments of their inequalities. The motions of the longitudes and arguments during the intervals, and the inequalities corresponding to the arguments are to be found on pp. 524–539 of vol. li.

The inclinations γ and the longitudes of the nodes Γ of the planes of the orbits referred to the plane of *Jupiter's* equator are the following :—

		Sat. I.		Sat. II.		Sat. III.		Sat. IV.	
		γ_1	$O-\Gamma_1$	γ_2	$O-\Gamma_2$	γ_3	$O-\Gamma_3$	γ_4	$O-\Gamma_4$
1895. Aug.	24	0°·0099	169°·3	0°·4832	167°·93	0°·1256	129°·58	0°·3389	28°·63
Sept.	23	99	170·7	·4830	168·92	·1257	129·78	·3386	28·68
Oct.	23	99	172·1	·4828	169·92	·1258	129·98	·3383	28·75
Nov.	22	99	173·5	·4826	170·91	·1259	130·17	·3381	28·81
Dec.	22	99	174·9	·4825	171·90	·1259	130·35	·3379	28·88
1896 Jan.	21	0·0099	176·3	0·4823	172·88	0·1260	130·53	0·3378	28·95
Feb.	20	99	177·7	·4821	173·86	·1261	130·71	·3377	29·02
Mar.	21	98	179·0	·4819	174·83	·1262	130·88	·3376	29·09
Apr.	20	98	180·4	·4817	175·80	·1262	131·04	·3376	29·16
May	20	98	181·7	·4816	176·76	·1263	131·20	·3376	29·24
June	19	0·0098	183·0	0·4814	177·71	0·1264	131·35	0·3377	29·32

In a "Note on the Determination of the Planes of the Orbits of *Jupiter's* Satellites," published in vol. xliv. p. 241 ff., it was pointed out that the most promising means for determining the longitudes of the nodes of the orbits with accuracy would be found in micrometrical measurements of the rectangular coordinates of the shadows of the satellites near their midtransits, if these measurements are made about the times when the planes of the orbits pass through the Sun. Though the opportunities of 1884, and at the next nodal passages in 1890, pointed out in vol. l. p. 347, appear to have been neglected, observers ought to be reminded of their opportunities offered during the present apparition of *Jupiter.* The nodal passages occur, indeed, too late in the season to allow corresponding observations to be made on both sides of the centre, and when *Jupiter* becomes accessible again after the conjunction with the Sun, the shadows will cross at greater distances from the centre. After another revolution of *Jupiter*, in 1908, the circumstances will be rather more favourable, but the best opportunities for getting corresponding observations before and after the nodal passages will only present themselves during the oppositions of 1920 and 1932. But, at the opposite node, the most favourable opportunities during *Jupiter's* 83 years' cycle will offer themselves in 1902 and 1914, and,